



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
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ATLANTA, GEORGIA 30303-1257

May 13, 2011

Mr. Michael Annacone
Vice President
Carolina Power and Light Company
Brunswick Steam Electric Plant
P. O. Box 10429
Southport, NC 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION
REPORT NOS.: 05000325/2011002 AND 05000324/2011002

Dear Mr. Annacone:

On March 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Unit 1 and 2 facilities. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 21, 2010, with Mr. Joe Frisco and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one finding associated with failure to promptly correct a condition adverse to quality regarding a manufacturing defect of a Barton Model 199 dual dampener differential pressure unit (DPU) used in the 1B residual heat removal (RHR) loop. This finding has potential safety significance greater than very low safety significance. Although the finding has potential safety significance, it did not represent an immediate safety concern because the finding did not represent a complete safety system functional failure (i.e. the other train of RHR remained operable).

In addition, the report documents one NRC-identified finding of very low safety significance (Green). The finding was determined to involve violations of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating the finding as non-cited violations (NCV) consistent with the NRC Enforcement Policy. If you contest the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Brunswick Steam Electric Plant. In addition, if you disagree with the cross-cutting aspect assigned the finding in this report, you should provide a response within 30 days of the date of

this inspection report, with the basis for your disagreement, to the Regional Administrator, Region 2, and the NRC Senior Resident Inspector at Brunswick. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's Rules of Practice, a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Randall A. Musser, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos.: 50-325, 50-324
License Nos.: DPR-71, DPR-62

Enclosure: Inspection Report 05000325, 324/2011002
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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Letter to Michael J. Annacone from Randall A. Musser dated May 13, 2011

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION
REPORT NOS.: 05000325/2011002 AND 05000324/2011002

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-325, 50-324

License Nos.: DPR-71, DPR-62

Report Nos.: 05000325/2011002, 05000324/2011002

Licensee: Carolina Power and Light (CP&L)

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: 8470 River Road, SE
Southport, NC 28461

Dates: January 1, 2011 through March 31, 2011

Inspectors: P. O'Bryan, Senior Resident Inspector
G. Kolcum, Resident Inspector
R. Kellner, Health Physicist (in Training)(2RS1, 2RS8, 4OA1, 4OA5.2)
G. Kuzo, Senior Health Physicist (2RS3)
W. Loo, Senior Health Physicist (2RS1, 2RS2, 2RS8, 4OA1, 4OA5.2)
A. Nielsen, Senior Health Physicist (4OA6)
W. Pursley, Health Physicist (in Training) (2RS1, 2RS8, 4OA1, 4OA5.2)
R. Williams, Reactor Inspector (1R08)
D. Jones, Senior Reactor Inspector (4OA5.3)
A. Alen, Reactor Inspector (4OA5.3)

Approved by: Randall A. Musser, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000325/2011002, 05000324/2011002; 01/01/11 - 03/31/11; Brunswick Steam Electric Plant, Units 1 & 2; Operability Evaluations, and Radiological Hazard Assessment and Exposure Controls.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. One NRC-identified finding and one self-revealing finding were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Cross-cutting aspects are determined using IMC 0310, "Components within the Cross Cutting Areas". Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- (TBD) A self-revealing Apparent Violation (AV) of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action was identified for failure to promptly correct a condition adverse to quality regarding a manufacturing defect of a Barton Model 199 dual dampener differential pressure unit (DPU) used in the 1B residual heat removal (RHR) loop. Specifically, the licensee failed to replace the DPU after the vendor determined that the manufacturing process was incorrect and could lead to a slow response of the component in safety-related applications. This led to a failure of the RHR system 1B loop minimum flow bypass valve, 1-E11-F007B, to operate on February 18, 2011. The failure of the defective DPU was tracked as NCR 448471 in the corrective action program, and the licensee replaced the defective DPU.

The inspectors determined that the licensee's failure to promptly correct a condition adverse to quality regarding a manufacturing defect for Barton Model 199 dual dampener DPUs was a performance deficiency. The finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the corrosion buildup in the DPU used in the control of the position of the minimum flow bypass valve for the 1B RHR loop had degraded, such that the availability and reliability of the 1B RHR loop was adversely affected. This finding was evaluated using Inspection Manual Chapter 0609, Significance Determination Process (SDP), Phase 1 Worksheet for mitigating systems. The finding required phase two and phase three SDP analyses by a regional senior analyst because the 1B loop of RHR was assumed to be inoperable for longer than its technical specification (TS) allowed outage time. The significance of this finding is designated as To Be Determined (TBD) until the safety characterization has been completed. This finding does not have a cross-cutting aspect because the performance deficiency occurred greater than three years ago and does not reflect current licensee performance. (Section 1R15)

Cornerstone: Occupational Radiation Safety

- Green. The inspectors identified a non-cited violation (NCV) of Technical Specification (TS) 5.4.1, Procedures, for the failure of the licensee to perform initial alpha activity analysis of air samples indicating greater than 0.3 Derived Air Concentration (DAC) beta-gamma activity on an approved alpha counter. Section 9.5.12.h of procedure HPS-NGGC-0024, Alpha Monitoring Guidelines, Rev. 3, states that if gamma scan results indicate the airborne activity is equal to or greater than the beta-gamma DAC-Fraction Action level of 0.3 DAC; (1) perform an initial alpha count on the air sample using a counter approved for air samples; and (2) assess and document the results per site-specific procedures. Contrary to this requirement, on March 10, 11, and 21, 2011, the licensee did not perform an initial alpha count on air samples using a counter approved for air samples and assess and document the results for gamma scan results that exceeded 0.3 DAC. Specifically, air samples for those selected work activities identified DAC concentrations of 0.6589, 0.3152 and 1.45. Licensee corrective actions included instructions to workers to ensure procedural adherence for sample analysis and changes to the software program to prompt the workers to do the sample analysis when the threshold limits were met or exceeded. The licensee entered the issue into its corrective action program as NCR 455307.

This finding is greater than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of Program and Process (Monitoring and Radiation Protection Controls) and adversely affects the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from airborne radioactive material during routine civilian nuclear reactor operation. Failure to identify potentially significant contributors to internal dose could lead to unmonitored occupational exposures. The finding was evaluated using IMC 0609, Appendix C, "Occupational Radiation SDP" and was determined to be of very low safety significance (Green) because it was not related to As Low As Reasonably Achievable (ALARA) Planning and the ability to assess dose was not compromised during these instances. In addition, it did not involve overexposure or substantial potential for overexposure because of the relatively low alpha source term in the areas where the surveys were performed. This conclusion was drawn from the results of beta/gamma and alpha smear surveys performed at those selected work locations. However, if left uncorrected, unmonitored internal exposure could have occurred. The cause of this finding was directly related to the cross-cutting aspect of maintaining effective interfaces between work groups in the Work Control component of the Human Performance area. [H.3(b)]. (Section 2RS1)

B. Licensee-Identified Violations

None

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REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at rated thermal power, and operated at or near full power for the entire inspection period.

Unit 2 began the inspection period at rated thermal power, and operated at or near full power until shutdown for a refueling outage on March 4, 2011. Unit 2 remained shut down for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed three partial system walkdowns of the following risk-significant systems:

- Units 1 and 2 conventional and nuclear service water systems with the 2B conventional service water pump out of service on February 1, 2011;
- 1A RHR loop with the 1B RHR loop out of service on February 17, 2011; and
- 2B RHR loop with the 2A RHR loop out of service on March 8, 2011.

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Final Safety Analysis Report (UFSAR), TS requirements, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify that system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

The inspectors performed a complete system alignment inspection of the Unit 2 core spray system to verify the functional capability of the system. This system was selected because it was considered both safety-significant and risk-significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line-ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders (WOs) was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment alignment problems were being identified and appropriately resolved.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Quarterly Resident Inspector Tours

a. Inspection Scope

The inspectors conducted five fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Service Water Building 20' Elevation 0PFP-SW-1a;
- Unit 1 Cable Spreading Room 23' Elevation 1PFP-CB-5;
- Unit 2 Cable Spreading Room 23' Elevation 2PFP-CB-6;
- Unit 2 North RHR Room -17' Elevation 2PFP-RB2-1; and
- Unit 2 North Core Spray Room -17' Elevation 2PFP-RB2-1.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and had implemented adequate compensatory measures for out-of-service, degraded or inoperable fire

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protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits; and that fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program.

b. Findings

No findings were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee's testing of the 2A RHR heat exchanger to verify that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee's observations as compared against acceptance criteria, the correlation of scheduled testing and the frequency of testing, and the impact of instrument inaccuracies on test results. Inspectors also visually inspected the service water side of the heat exchanger to ensure that the heat exchanger was free of debris and biological growth.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities

From March 14, 2011, through March 18, 2011, the inspectors conducted a review of the implementation of the Licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system, emergency feedwater systems, containment systems, and risk-significant piping and components.

The inspections described in Sections 1R08.1 and 1R08.2 below constituted one inservice inspection sample as defined in Inspection Procedure 71111.08-05.

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.1 Piping Systems ISI

a. Inspection Scope

The inspectors observed or reviewed records of the following non-destructive examinations mandated by the American Society of Mechanical Engineers (ASME) Code Section XI to evaluate compliance with the ASME Code Section XI and Section V requirements and, if any indications and defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code or an NRC-approved alternative requirement.

- Phased array ultrasonic examination of the N9 nozzle (Class 1);
- Ultrasonic examination of three main steam isolation valve (MSIV) base metal repair welds (Class 1);
- Liquid penetrant examination of three MSIV base metal repair welds (Class 1);
- Magnetic particle examination of three MSIV base metal repair welds (Class 1);
- Magnetic particle examination of inboard MSIV F022D (Class 1); and
- General visual examinations of three containment surfaces.

Since the previous refueling outage, the licensee conducted a review of ASME Code Section XI required non-destructive surface and volumetric examinations and did not identify any recordable indications. Therefore, no NRC review was completed for this inspection procedure attribute.

The inspectors observed or reviewed the following pressure boundary welds for risk-significant systems during the outage to evaluate if the licensee applied the preservice non-destructive examinations and acceptance criteria required by the Construction Code, NRC-approved Code case, NRC-approved Code relief request or the ASME Code Section XI. In addition, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records to evaluate if the weld procedures were qualified in accordance with the requirements of Construction Code and the ASME Code Section IX.

- WO 1490271-01, 2-B21-F022D – perform guide pad mod IAW EC 47474;
- WO 1525781-01 – refurbish contaminated MSIV bonnets; and
- WO 1672606-01 — seal weld the 1-B32-F031A body-to-bonnet joint.

The inspectors reviewed the following non-destructive examination (NDE) activities associated with the inspection of reactor vessel internal components (Boiling Water Reactors Vessel Internals Project):

- EVT-1 of two jet pump assemblies; and
- VT-3 of four jet pump riser arm welds (Class 1).

The inspectors also reviewed the calculations performed to support continued service for an indication discovered on jet pump JPCRS-1 during the previous outage. The

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inspectors verified that the indication growth since the last outage was within the requirements set forth in the applicable Code.

b. Findings

No findings were identified.

.2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a review of ISI-related problems entered into the licensee's corrective action program and conducted interviews with licensee staff to determine if:

- the licensee had established an appropriate threshold for identifying ISI-related problems;
- the licensee had performed a root cause (if applicable) and taken appropriate corrective action; and
- the licensee had evaluated operating experience and industry generic issues related to ISI and pressure boundary integrity.

The Inspectors performed these reviews to evaluate compliance with 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, requirements.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program

a. Inspection Scope

On January 16, 2011, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator training to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan (EP) actions and notifications.

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The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors evaluated two degraded performance issues involving the following risk-significant systems:

- Historical performance of the Unit 1 and Unit 2 power plant computers; and
- Electrical ground on the 2A RHR service water booster pump control power circuit on February 7, 2011.

The inspectors reviewed events where ineffective equipment maintenance may have resulted in equipment failure or invalid automatic actuations of Engineered Safeguards Systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring; and
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified that maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the five maintenance and emergent work activities affecting risk-significant equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Failure of 1-CAC-CS-4178, Unit 1 wetwell vent override switch on January 6, 2011;
- Failure of the 2D service air compressor on January 19, 2011;
- Emergent maintenance on the 2A RHR service water booster pump on February 7, 2011;
- 1B RHR loop out of service for planned maintenance February 16, 2011 through February 18, 2011; and
- Failure of the 2B-2 battery charger on March 28, 2011.

These activities were selected based on their potential risk-significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify that risk analysis assumptions were valid and applicable requirements were met.

b. Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following five issues:

- Damaged control room ventilation envelope door CR-113, NCR 439941;
- Low wall thickness on Unit 2 RHR system piping, NCR 443061;
- Incorrect ratings for the Unit 1 and Unit 2 electrical protection assemblies (EPA) circuit breakers, NCR 443476;
- Failure of the 1B and 1D RHR service water booster pump control power voltage tests, NCR 448225; and
- Failure of the 1B RHR loop minimum flow control valve to operate, NCR 448471, NCR 448577, and NCR 450795.

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The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to the licensee's evaluations, to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

b. Findings

Introduction. A self-revealing AV of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action was identified for failure to promptly correct a condition adverse to quality regarding a manufacturing defect of Barton Model 199 dual dampener differential pressure unit (DPU) used in the 1B RHR loop. Specifically, the licensee failed to replace the DPU after the vendor determined that the manufacturing process was incorrect and could lead to a slow response of the component in safety-related applications. This led to a failure of the RHR system 1B loop minimum flow bypass valve, 1-E11-F007B, to operate on February 18, 2011.

Description. The licensee failed to promptly correct a condition adverse to quality regarding manufacturing defects of Barton Model 199 dual dampener differential pressure units. Barton Instrument Systems issued an advisory related to dual dampener DPUs in October 2001. The advisory informed the licensee that water-filled DPUs built prior to 1997 were susceptible to a manufacturing defect due to an additional dampener port drilled internal to the DPU. The additional drilled port was not re-passivated. Passivation is a chemical process to provide corrosion protection for stainless steels. As the small diameter port in the DPU corrodes over time, corrosion products may clog openings in the DPU, making it susceptible to slow operation and failure. The licensee received the Barton advisory in January 2002. The licensee's evaluation of the condition concluded that if the DPUs in stores and in operation had not failed yet, they were unlikely to fail in the future, and normal testing would be sufficient to detect impending failure.

On February 15, 2011, during maintenance on the DPU for the 1B RHR loop minimum flow valve, 1-E11-F007B, the DPU failed calibration. The DPU was discovered stuck in one position, out of calibration, sluggish, and difficult to operate. Troubleshooting continued until the licensee was able to obtain a successful calibration on February 16, 2011. A post-maintenance test (PMT) was performed on February 18, 2011, for the 1B loop of RHR and approximately twenty-five minutes into the test, the minimum flow bypass valve failed to operate correctly. NCR 448471 was initiated. The minimum flow bypass valve has a safety-related function in the open direction to automatically open to

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permit bypass flow when the pump's flow is insufficient for pump cooling and in the closed direction to prevent diversion of flow from the pump during low pressure coolant injection and containment cooling modes. Additional failures occurred during system operation until March 7, 2011 when the licensee replaced the DPU with a non-susceptible, silicone-filled model that was not part of the 2001 advisory and installed a temporary modification to maintain the valve normally open. In addition, the licensee implemented compensatory actions to ensure that susceptible DPU's in other plant applications are not in a failed state until replacement DPU's can be procured and installed.

Analysis. The inspectors determined that the licensee's failure to promptly correct a condition adverse to quality regarding a manufacturing defect for Barton Model 199 dual dampener DPUs was a performance deficiency. The finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the corrosion buildup in the DPU used in the control of the position of the minimum flow bypass valve for the 1B RHR loop had degraded, such that the availability and reliability of the 1B RHR loop was adversely affected. This finding was evaluated using Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet for mitigating systems. The finding required phase two and phase three SDP analyses by a regional senior analyst because the 1B loop of RHR was assumed to be inoperable for longer than its TS allowed outage time. The significance of this finding is designated as To Be Determined (TBD) until the safety characterization has been completed. This finding does not have a cross-cutting aspect because the performance deficiency occurred greater than three years ago and does not reflect current licensee performance.

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly corrected. Contrary to this, the licensee failed to take prompt and adequate corrective action, causing the failure of the minimum flow bypass valve in the 1B RHR loop. This issue has been entered into the licensee's corrective action program as NCR 448471. Pending completion of the safety characterization, this finding is identified as AV 05000325/2011002-01, Failure To Adequately Evaluate And Correct A Condition Adverse To Quality Involving A Manufacturing Defect Of Barton Model 199 Dual Dampener Differential Pressure Units.

1R18 Plant Modifications

a. Inspection Scope

The following two engineering design packages were reviewed and selected aspects were discussed with engineering personnel:

- Engineering Change (EC) 79448, Rerouting of the Unit 1 hotwell makeup from the condensate storage tank (temporary modification); and

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- EC 80291, Defeating automatic operation of the 1B RHR minimum flow valve (temporary modification).

This document and related documentation were reviewed for adequacy of the associated 10 CFR 50.59 safety evaluation screening, consideration of design parameters, implementation of the modification and post-modification testing, and relevant procedures, design, and licensing documents were properly updated. The inspectors observed ongoing and completed work activities to verify that installation was consistent with the design control documents.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following four post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- 1MST-RPS26Q, RPS High Drywell Pressure Trip Unit Channel Calibration, after replacement of wetwell vent relays associated with switch 1-CAC-CS-4178 on January 11, 2011;
- 2OP-43, Residual Heat Removal System Operating Procedure, after repair of the 2A RHR service water booster pump discharge pressure switch 2-SW-PS-1175A on February 7, 2011;
- 0PT-12.2B, No. 2 Diesel Generator Monthly Load Test, after planned maintenance on February 15, 2011; and
- 0PT-08.2.2b, LPCI/RHR System Operability Test – Loop B and 0PT-08.2.7, LPCI/RHR Pump Response Time Test, after modification of the 1B loop minimum flow valve logic on March 7, 2011.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following: the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing, and test documentation was properly evaluated. The inspectors evaluated the activities against TS and the UFSAR to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety.

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b. Findings

No findings were identified.

1R20 Outage Activitiesa. Inspection Scope

The inspectors reviewed the outage plan and contingency plans for the Unit 2 refueling outage, which started on March 4, 2011, and extended through the end of the inspection period, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the refueling outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- Licensee configuration management, including maintenance of defense-in-depth for key safety functions and compliance with the applicable TS when taking equipment out of service;
- Implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing;
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error;
- Controls over the status and configuration of electrical systems to ensure that TS and outage safety plan requirements were met, and controls over switchyard activities;
- Monitoring of decay heat removal processes, systems, and components;
- Controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system;
- Reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss;
- Controls over activities that could affect reactivity;
- Maintenance of secondary containment as required by TS;
- Refueling activities, including fuel handling and storage; and
- Licensee identification and resolution of problems related to refueling outage activities.

b. Findings

No findings were identified.

1R22 Surveillance Testing

.1 Routine Surveillance Testing

a. Inspection Scope

The inspectors either observed surveillance tests or reviewed the test results for the three following activities to verify the tests met TS surveillance requirements, UFSAR commitments, inservice testing requirements, and licensee procedural requirements. The inspectors assessed the effectiveness of the tests in demonstrating that the SSCs were operationally capable of performing their intended safety functions.

- OPT-08.2.2b, LPCI/RHR System Operability Test – Loop B on February 24, 2011;
- OPT-13.1, Unit 1 Reactor Recirculation Jet Pump Operability on March 10, 2011; and
- OPT-12.2B, No. 2 Diesel Generator Monthly Load Test on March 15, 2011.

b. Findings

No findings were identified.

.2 In-Service Testing (IST) Surveillance

a. Inspection Scope

The inspectors reviewed the performance of OPT-07.2.4A, Unit 1 Core Spray System Operability Test - Loop A on January 12, 2011, to evaluate the effectiveness of the licensee's American Society of Mechanical Engineers (ASME) Section XI testing program for determining equipment availability and reliability. The inspectors evaluated selected portions of the following areas: 1) testing procedures; 2) acceptance criteria; 3) testing methods; 4) compliance with the licensee's IST program, TS, selected licensee commitments and code requirements; 5) range and accuracy of test instruments; and 6) required corrective actions.

b. Findings

No findings were identified.

.3 Containment Isolation Valve Testing

The inspectors reviewed the test results for the following two activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify that testing was conducted in accordance with applicable procedural and TS requirements:

- OPT-20.3-B21, Local Leak Rate Testing for the Feedwater System for valve 2-B21-F010B on March 9, 2011; and

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- OPT-20.3-B32, Local Leak Rate Testing for the Recirculation System for valve 2-B32-F032B on March 10, 2011.

The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether: any preconditioning occurred; acceptance criteria were clearly stated and were consistent with the system design basis; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; test data and results were accurate, complete, within limits, and valid; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the corrective action program.

b. Findings

No findings were identified.

1EP6 Emergency Planning Drill Evaluation

a. Inspection Scope

The inspectors observed a site emergency preparedness training drill conducted on January 11, 2011. The inspectors reviewed the drill scenario narrative to identify the timing and location of classifications, notifications, and protective action recommendations development activities. During the drill, the inspectors assessed the adequacy of event classification and notification activities. The inspectors observed portions of the licensee's post-drill critique. The inspectors verified that the licensee properly evaluated the drill's performance with respect to performance indicators and assessed drill performance with respect to drill objectives.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls

a. Inspection Scope

Radiological Hazard Assessment and Exposure Controls. The inspectors evaluated licensee performance in assessing radiological hazards and controlling worker access to radiologically-significant areas. The inspectors evaluated communications to the workers, contamination and radioactive material control, radiological hazard controls to include work coverage, controls and contingencies for risk-significant high radiation areas (HRA) and very high radiation areas (VHRA), radiation worker practices and technician proficiency and problem identification and resolution.

Radiological Hazard Assessment. During facility tours, the inspectors directly observed postings and physical controls for radiation areas, HRAs, locked HRAs (LHRA), VHRA, and potential airborne radioactivity areas established within the radiologically-controlled area (RCA) of the Unit 2 drywell, Unit 1 and Unit 2 reactor and turbine buildings, Independent Spent Fuel Storage Installation (ISFSI), and radioactive waste (radwaste) processing and storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas. Results were compared to current licensee surveys and assessed against established postings and Radiation Work Permit (RWP) controls. Licensee key control and access barrier effectiveness were evaluated for selected LHRA and VHRA locations. Changes to procedural guidance for LHRA and VHRA controls were discussed with radiation protection (RP) supervisors. Controls and their implementation for storage of irradiated material within the spent fuel pool (SFP) were reviewed and discussed. In addition, licensee controls for areas where dose rates could change significantly because of plant shutdown and refueling operations associated with the Unit 2 refueling outage (RFO) were reviewed and discussed. The licensee's deployment of portable air monitors was reviewed and the airborne radioactivity monitoring program was discussed with cognizant RP personnel.

Instructions to Workers. As part of the review, the inspectors reviewed the As Low As Reasonably Achievable (ALARA) packages and RWPs for selected Unit 2 RFO activities. The inspectors observed RP personnel providing entry briefings to workers entering the Unit 2 drywell and reactor building to conduct work associated with snubber inspections, motor-operated valve activities, chemical decontamination associated with reactor water cleanup activities, inboard MSIV activities, and torus diving activities. Container labeling was reviewed for legibility, currency and clarity for selected areas of the Unit 2 drywell, Unit 1 and Unit 2 reactor and turbine buildings, radwaste processing areas, ISFSI, and in the RCA of the yard.

Contamination and Radioactive Material Control. The inspectors observed the routine release of materials and personnel from the RCA. The sensitivity of the instrumentation

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was discussed with selected RP personnel. The inspectors reviewed the radioactive source inventory and verified the physical presence of the most radiologically-significant sources. The inspectors reviewed a memo documenting the transmittal of database information submitted to the National Source Tracking System (NSTS) per 10 CFR 20.2207.

Radiological Hazards Control and Work Coverage. The inspectors reviewed radiological conditions for consistency with posted surveys, RWPs and worker briefings. The RP controls were assessed for area radiation surveys, radiation postings, radiation contamination controls and RP job coverage for selected Unit 2 RFO work activities. The inspectors observed selected Unit 2 RFO job coverage for activities associated with the refueling floor and controls for highly activated or contaminated materials stored underwater. The inspectors observed selected Unit 2 RFO work activities via closed circuit television in the remote monitoring room. During tours of the licensee facilities, the inspectors checked postings and verified locking on areas with dose rates greater than 1,000 millirem per hour at 30 centimeters from the source.

Risk-Significant HRAs and VHRA Controls. The inspectors discussed the controls for high risk HRAs and VHRAs with the RP Manager. The procedures that would be implemented where conditions had changed or were reasonably expected to change resulting in the creation of HRAs, LHRAs or VHRAs were discussed with selected operational RP Supervisors. The inspectors observed RP staff issuing LHRA keys for selected Unit 2 RFO work activities.

Radiation Worker and Technician. The inspectors observed radiation worker performance and RP technician proficiency during tours of selected areas of the plant. The inspectors reviewed corrective action program documents identifying radiation worker performance issues and RP technician proficiency. The inspectors reviewed the corrective action program documents for determination of reporting threshold, as well as adequacy of resolution of the reported problems. The review included an evaluation of selected electronic dosimeter (ED) alarms to determine if the identified events constituted exceeding the performance indicator reporting thresholds.

RP activities were evaluated against the requirements of UFSAR Section 12; TS 5.7.1 and 5.7.2. 10 CFR Parts 19 and 20; and approved licensee procedures.

Problem Identification and Resolution. Licensee's corrective action program documents associated with access control to radiologically-significant areas were reviewed and assessed. This included review of selected Condition Reports (CRs) related to radworker and RP technician performance. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedure CAP-NGGC-200, Condition Identification and Screening Process, Revision 33. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

The inspectors completed all specified line-items detailed in Inspection Procedure (IP) 71124.01 (sample size of 1).

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b. Findings

Introduction. The inspectors identified a NCV of TS 5.4.1 for the failure of the licensee to perform initial alpha activity analysis of air samples indicating greater than 0.3 Derived Air Concentration (DAC) beta-gamma activity on an approved alpha counter as required by the licensee's procedures.

Description. On March 10, 11, and 21, 2011, the licensee did not perform an initial alpha count on air samples where gamma scan results exceeded 0.3 DAC. Specifically, air samples for selected work activities identified DAC concentrations of 0.6589, 0.3152 and 1.45. These samples were not evaluated for alpha in accordance with HPS-NGGC-0024, Alpha Monitoring Guidelines, Rev. 3. When an air sample was collected, RP performed an initial screening count to determine if further evaluation would be required. If the screening results exceeded the 0.3 DAC criteria, then the sample would be sent to Chemistry for an isotopic analysis. If the isotopic analysis confirmed that the results exceeded the 0.3 DAC criteria then the sample would be further evaluated on an approved alpha counter by Chemistry personnel at the request of RP. For those selected work activities, RP did not request Chemistry to perform an initial alpha count using an approved counter. The licensee had identified low levels of alpha activity in the source term based on the results of 10 CFR 61 sample analysis and area radiation contamination surveys of the plant.

Analysis. The inspectors determined that the routine failure to follow the procedural requirement to perform alpha activity analysis of air samples exceeding the trigger level of 0.3 DAC beta-gamma activity, was a performance deficiency. This finding is greater than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of Program and Process (Monitoring and RP Controls) and adversely affects the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from airborne radioactive material during routine civilian nuclear reactor operation. Failure to identify potentially significant contributors to internal dose could lead to unmonitored occupational exposures. The finding was evaluated using the Occupational Radiation Safety SDP and was determined to be of very low safety significance (Green) because it was not related to ALARA planning and the ability to assess dose was not compromised during these instances. In addition, it did not involve overexposure or substantial potential for overexposure because of the relatively low alpha source term in the areas where the surveys were performed. This conclusion was drawn from the results of beta/gamma and alpha smear surveys performed at those selected work locations. However, if left uncorrected, unmonitored internal exposure could have occurred in areas of the plant where alpha emitters would be present. The cause of this finding was directly related to the cross-cutting aspect of maintaining effective interfaces between work groups in the Work Control component of the Human Performance area. [H.3(b)].

Enforcement. TS 5.4.1, Administrative Control (Procedures), requires that written procedures shall be established, implemented, and maintained, covering applicable procedures recommended in RG 1.33, App. A, Nov. 1972 (Safety Guide 33, Nov. 1972). Section G.5.c of RG 1.33, App. A, Nov. 1972 (Safety Guide 33, Nov. 1972) states that

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the licensee has procedures for control of radioactivity for personnel monitoring and special work permit for surveys and monitoring. Procedure HPS-NGGC-0024, Alpha Monitoring Guidelines, Rev. 3 implements the requirement to perform alpha monitoring activities. Sect. 9.5.12.h. of the procedure states that if gamma scan results indicate the airborne activity is equal to or greater than the beta-gamma DAC-Fraction Action level of 0.3 DAC: (1) perform an initial alpha count on the air sample using a counter approved for air samples; and (2) assess and document the results per site-specific procedures. Contrary to the above, on March 10, 11, and 21, 2011, the licensee did not perform an initial alpha count on air samples using a counter approved for air samples and assess and document the results for gamma scan results that exceeded 0.3 DAC. Specifically, air samples for those selected work activities identified DAC concentrations of 0.6589, 0.3152 and 1.45, which had exceeded the 0.3 DAC concentration criteria and had not been counted on an approved alpha counter, assessed, and documented per site-specific procedures. Licensee corrective actions included instructions to workers to ensure procedural adherence for sample analysis and changes to the software program to prompt the workers to do the sample analysis when the threshold limits were met or exceeded. Because this violation was of very low significance and was entered into the licensee's corrective action program (NCR 455307), this violation is being treated as an NCV, consistent with the NRC Enforcement Policy, and is identified as NCV 05000325/324, 20110002-02, Failure to follow procedures for analyzing radiological air samples for the presence of alpha emitters.

2RS2 As Low As Reasonably Achievable (ALARA)

a. Inspection Scope

ALARA Program Status. The inspectors reviewed and discussed plant exposure history and current trends including the site's three-year rolling average (TYRA) collective exposure history for calendar year (CY) 2007, through CY 2009. Current and proposed activities to manage site collective exposure and trends regarding collective exposure were evaluated through review of previous TYRA collective exposure data and review of the licensee's 5-year ALARA program implementing plan. Current ALARA program guidance and recent changes, as applicable, regarding estimating and tracking exposure were discussed and evaluated.

Radiological Work Planning The inspectors reviewed planned work activities and their collective exposure estimates for Unit 2 RFO. Work activities, exposure estimates and mitigation activities were reviewed for selected Unit 2 RFO work activities that included B220R1 motor operated valve project, insulation removal and replacement, main steam isolation valve, scaffolding, refuel floor, integrated inspections, 2-B32-F023A and F031A seal weld repair, and 2-E11-F050A repair. For the selected tasks, the inspectors reviewed dose mitigation actions and established dose goals. During the inspection, use of remote technologies including teledosimetry and remote visual monitoring were verified as specified in RWP or procedural guidance. Current collective dose data for selected tasks were compared with established estimates and, where applicable, changes to established estimates were discussed with responsible licensee ALARA planning representatives. The inspectors reviewed previous post-job reviews conducted

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for the previous Unit 1 RFO and verified that the items were entered into the licensee's CAP for evaluation.

Verification of Dose Estimates and Exposure Tracking Systems. The inspectors reviewed select ALARA work packages and discussed assumptions with responsible planning personnel regarding the bases for the current estimates. The licensee's on-line RWP cumulative dose data bases used to track and trend current personal and cumulative exposure data and/or to trigger additional ALARA planning activities in accordance with current procedures were reviewed and discussed. Selected work-in-progress reviews for thimble and reactor coolant pump motor replacement project activities and adjustments to cumulative exposure estimate data were evaluated against work scope changes or unanticipated elevated dose rates.

Source Term Reduction and Control. The inspectors reviewed historical dose rate trends for shutdown chemistry, cleanup, and resultant chemistry and RP trend-point data against the current Unit 2 RFO data. Licensee actions to mitigate noble gas and iodine exposures resulting from fuel leaks were discussed in detail.

Problem Identification and Resolution. The inspectors reviewed and discussed selected CRs associated with ALARA program implementation. The reviewed items included CRs, self-assessments, and quality assurance audit documents. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with licensee procedure CAP-NGGC-0200, Condition Identification and Screening Process, Rev. 33.

The licensee's ALARA program activities and results were evaluated against the requirements of UFSAR Section 12; TS Sections 5.4 and 5.7; 10 CFR Parts 19 and 20; and approved licensee procedures.

Radiation worker performance was reviewed as part of observations conducted for IP 71124.01 and is documented in section 2RS1. The inspectors completed all specified line items detailed in IP 71124.02 (sample size of 1).

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation

a. Inspection Scope

Plant Airborne Radioactivity Controls and Mitigation. The inspectors reviewed the plant's UFSAR and current Unit 2 RFO tasks to identify areas and tasks with the potential for elevated airborne radionuclide concentrations. Selected engineering controls including the Unit 2 dry well purge, refueling floor ventilation, and temporary HEPA filtration units for minimizing personal exposure, and airborne radiation monitoring instrumentation located within the low level radioactive waste processing building and

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refueling floor areas were discussed with RP and operations staff. In addition, selected licensee documents including TS, UFSAR, design basis documents, Emergency Response Organization (ERO) rosters, and procedures associated with plant airborne radioactivity controls and monitoring, and with respiratory protection program and emergency planning implementation were reviewed and discussed with cognizant licensee representatives.

Engineering Controls. Licensee engineering controls to control and mitigate airborne radioactivity were reviewed and discussed. The inspectors evaluated engineering controls use for RP purposes including operation of the Unit 2 Dry Well Purge and Refueling Floor ventilation, and installation of temporary HEPA systems for selected tasks and operations with the potential for generating airborne activity conditions during the current Unit 2 RFO. The evaluation included procedural guidance, operability testing, and established configurations during specific tasks. In addition, plant guidance and its implementation for the monitoring of potential airborne beta-gamma and alpha-emitting radionuclides for insulation removal were reviewed and discussed with licensee representatives.

Use of Respiratory Protection Devices. Program guidance for issuance and use of respiratory protection devices was reviewed and discussed with responsible licensee representatives. The inspectors reviewed Total Effective Dose Equivalent (TEDE)-ALARA evaluations conducted for the select Unit 2 RFO tasks with an emphasis on insulation removal activities. Selected whole-body count routine and investigative analysis results for occupational workers were reviewed and discussed. Use of respiratory protective equipment was evaluated for the workers involved in Unit 2 RFO initial dry well entry, and those involved in dry well insulation removal activities. The inspectors toured selected onsite compressors available for supplying breathing air for current outage activities and verified Grade D or greater air certification for all on-site compressors. Training, fit testing, and medical qualifications for selected RP, maintenance, and operations staff using respiratory protection activities for Unit 2 RFO activities were reviewed and verified.

Self-Contained Breathing Apparatus (SCBA) for Emergency Use. The inspectors verified current status, operability and availability of select SCBA equipment maintained within the firehouse, operations support center, Unit 1 and Unit 2 control rooms, and reactor auxiliary building. Maintenance activities for selected respiratory protective equipment, e.g., compressed gas cylinders, regulators, valves, and hose couplings by certified vendor technicians was verified for selected SCBA units. Training, fit testing, and medical qualifications for selected RP, maintenance, and operations staff assigned ERO duties was reviewed and verified. For selected Unit 1 and Unit 2 control room operators, the inspectors discussed and verified annual hands-on SCBA training activities including donning, doffing and functionally checking SCBA equipment and availability of corrective lenses, as applicable, for on-shift personnel.

Problem Identification and Resolution. The inspectors reviewed selected corrective action program documents within the area of radiological airborne controls and respiratory protection activities. The inspectors evaluated the licensee's ability to identify

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and resolve the issues in accordance with CAP-NGGC-0200, Condition Identification and Screening Process, Rev. 33, and CAP-NGGC-205, Condition Evaluation and Corrective Action Process, Rev. 12. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

RP program activities associated with airborne radioactivity monitoring and controls were evaluated against details and requirements documented in the UFSAR Sections 11 and 12; TS Section 5.4 Procedures, 10 CFR Part 20; and approved licensee procedures. Documents reviewed are listed in Sections 2RS1, 2RS2, and 2RS3. The inspectors completed all specified line-items detailed in IP 71124.03 (sample size of 1).

a. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

a. Inspection Scope

Waste Processing and Characterization. During inspector walk-downs, accessible sections of the liquid and solid radioactive waste (radwaste) processing systems were assessed for material condition and conformance with system design diagrams. Inspected equipment included radwaste storage tanks; resin transfer piping, resin and filter packaging components; and unused evaporator equipment. The inspectors discussed component function, processing system changes, and radwaste program implementation with licensee staff. In addition, the inspectors completed a walkdown of a spent resin transfer system and dewatering facility and observed shredding and compacting of Dry Active Waste (DAW) in the low level radioactive waste facility.

The 2009 Radioactive Effluent Release Report and radionuclide characterizations from 2009 – 2010, for each major waste stream, were reviewed and discussed with radwaste staff. For reactor water and condensate (primary) resin, reactor coolant system filters, and DAW the inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. Waste stream mixing and concentration averaging methodology for resins and filters was evaluated and discussed with radwaste staff. The inspectors also reviewed the licensee's procedural guidance for monitoring changes in waste stream isotopic mixtures.

Radwaste processing activities and equipment configuration were reviewed for compliance with the licensee's Process Control Program (PCP) and UFSAR, Chapter 11. Waste stream characterization analyses were reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 61, and guidance provided in the Branch Technical Position on Waste Classification (1983).

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Radioactive Material Storage. During walk-downs of indoor and outdoor radioactive material storage areas, the inspectors observed the physical condition and labeling of storage containers and the posting of Radioactive Material Areas. The inspectors also reviewed licensee procedural guidance for storage and monitoring of radioactive material.

Radioactive material and waste storage activities were reviewed against the requirements of 10 CFR Part 20.

Transportation. The inspectors directly evaluated licensee actions during preparation of a condensate pump motor for shipment and inspected a previously-prepared rail car shipment containing five c-van containers awaiting shipment. The inspectors noted package markings and labeling, performed independent dose rate measurements, and interviewed shipping technicians regarding their knowledge of Department of Transportation (DOT) regulations.

Selected shipping records were reviewed for consistency with licensee procedures and compliance with NRC and DOT regulations. The inspectors reviewed emergency response information, DOT shipping package classification, waste classification, and radiation survey results, and evaluated whether receiving licensees were authorized to accept the packages. Licensee procedures for opening and closing Type A shipping containers were compared to manufacturer requirements. In addition, training records for selected individuals currently qualified to ship radioactive material were reviewed.

Transportation program implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71, 49 CFR Parts 172-178, as well as the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H.

Problem Identification and Resolution. The inspectors reviewed CRs in the area of radwaste/shipping. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure CAP-NGGC-0200, Condition Identification and Screening Process, Rev. 33, and CAP-NGGC-0205, Condition Evaluation and Corrective Action Process, Rev. 12. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

The inspectors completed all specified line-items detailed in IP 71124.08 (sample size of 1).

b. Findings

No findings were identified.

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4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

To verify the accuracy of the PI data reported to the NRC, the inspectors compared the licensee's basis in reporting each data element listed below to the PI definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, Regulatory Assessment Indicator Guideline.

Initiating Events Cornerstone

- Unplanned scrams per 7000 Critical Hours;
- Unplanned scrams with complications; and
- Unplanned power changes per 7000 Critical Hours

The inspectors sampled licensee submittals for the performance indicators listed above for the period of the first quarter 2010 through the fourth quarter 2010. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports and NRC inspection reports for the period to validate the accuracy of the submittals.

Occupational Radiation Safety Cornerstone

The inspectors reviewed, evaluated, and discussed PI data collected from January 1, 2010, through February 28, 2011, for the Occupational Exposure Control Effectiveness PI. For the reviewed period, the inspectors assessed corrective action program records to determine whether HRA, VHRA or unplanned exposures, resulting in TS or 10 CFR 20 non-conformances, had occurred during the review period. The review included evaluation of selected personnel contamination event data, internal dose assessment results, and electronic dosimeter (ED) alarms for cumulative doses and/or dose rates exceeding established set-points.

Public Radiation Safety Cornerstone

The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from January 1, 2010, through February 28, 2011. For the assessment period, the inspectors reviewed cumulative and projected doses to the public and CR documents related to Radiological Effluent TS/Offsite Dose Calculation Manual issues.

b. Findings

No findings were identified.

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4OA2 Identification and Resolution of Problems

.1 Routine Review of Items Entered Into the Corrective Action Program

a. Inspection Scope

To aid in the identification of repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed frequent screenings of items entered into the licensee's corrective action program. The review was accomplished by reviewing daily action request reports.

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Independent Spent Fuel Storage Installation (ISFSI) Inspections

a. Inspection Scope

The inspectors reviewed reported changes made to the licensee's procedures and programs for the ISFSI to verify the changes made were consistent with the license and Certificate of Compliance (CoC), and did not reduce the effectiveness of the program. The inspectors, through direct observation and independent evaluation, verified that cask loading activities were performed in a safe manner and in compliance with approved procedures for the Unit 1 fuel loading activities during the week of February 7, 2011. Based on direct observation and review of selected records, the inspectors verified the licensee had properly identified each fuel assembly placed in the ISFSI, had recorded the parameters and characteristics of each fuel assembly, and had maintained a record of each as a controlled document. Activities observed include: transport and storage of a cask; loading of spent fuel into a cask; drying and cask seal welding activities; and lifting and rigging the cask from the spent fuel pool. The inspectors reviewed the design limitation for each cask and compared the specified cask loading to the cask's loading limitations. The inspectors verified that limitations for heavy load lifts in and around the spent fuel pool had been incorporated into the licensee's procedures and were being implemented.

b. Findings

No findings were identified.

.2 (Closed) Temporary Instruction (TI) 2515/179 Verification of Licensee Responses to NRC Requirement for Inventories of Materials Tracked in the National Source Tracking System Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207)

a. Inspection Scope

The inspectors performed the TI concurrent with IP 71124.01, Radiation Hazard Analysis. The inspectors reviewed the licensee's source inventory records and identified the sources that met the criteria for reporting to the National Source Tracking System (NSTS). The inspectors visually identified the sources contained in various calibration systems and verified the presence of the source by direct radiation measurement using a calibrated portable radiation detection survey instrument. The inspectors reviewed the physical condition of the irradiation device. The inspectors reviewed the licensee's procedures for source receipt, maintenance, transfer, reporting and disposal. The inspectors reviewed documentation that was used to report the sources to the NSTS. This completes the Region II inspection requirements.

b. Findings

No findings were identified.

.3 (Closed) TI 2515/177, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter (GL) 2008-01)"

a. Inspection Scope

The inspectors reviewed the implementation of the licensee's actions in response to Generic Letter 2008-01. The systems reviewed included the high pressure coolant injection, low pressure coolant injection, and core spray systems. The inspectors performed the following inspection activities. Documents reviewed are listed in the Attachment.

- Reviewed the licensing basis to verify that actions to address gas accumulation were consistent with the operability requirements
- Reviewed the design basis to verify that actions taken to address gas accumulation were appropriate
- Reviewed analyses performed by the licensee to verify that methodologies for predicting gas void accumulation, movement, and impact were appropriate
- Reviewed test procedures and test results to verify that test procedures were appropriate to detect gas accumulations that could challenge the safety function of these systems
- Reviewed the testing frequencies to verify that the testing intervals were appropriate based on historical gas accumulation events and susceptibility to gas accumulation
- Reviewed the test programs and processes to verify that they were sensitive to precursors to gas accumulation

Enclosure

- Reviewed corrective actions associated with gas accumulation to verify that identified issues were being appropriately identified and corrected
- Reviewed plant modifications including the installation of additional vent valves
- Reviewed selected vent valve installations to verify that the locations selected were appropriate
- Performed walk downs of selected subject systems to verify that the reviews and design verifications conducted by the licensee had drawn appropriate conclusions with respect to piping configurations and pipe slope which could result in gas accumulation susceptibility

b. Findings

No findings were identified.

4OA6 Management Meetings

On January 26, 2011, the inspectors held a teleconference with licensee staff and a State of North Carolina radiation protection representative to discuss the status of BSEP's groundwater monitoring program. The licensee provided an update on tritium concentrations in water collected from onsite and offsite groundwater and surface water sampling locations, and discussed ongoing remediation efforts associated with the onsite storm drain stabilization pond (SDSP). Although seasonal fluctuations can occur, the inspectors noted that onsite tritium concentrations in and near the SDSP have generally trended downward since 2007 when the contamination was discovered and corrective action was initiated. The inspectors also noted that although very low concentrations of tritium have been identified periodically in the offsite environs, e.g. Nancy's Creek immediately adjacent to the SDSP, all reported values for offsite samples have remained significantly below established regulatory limits. The licensee is nearing completion of a network of sub-surface pumping wells designed to remediate the groundwater in and around the SDSP and will soon begin construction of a new-double lined pond to replace the SDSP. The details surrounding a leak of tritiated water from underground piping associated with the Unit 1 condensate storage tank (CST) in December 2010 were also discussed. More information on this leak can be found in Inspection Report 2010-005 and in a docketed 30-day report to the NRC. The meeting details are documented in NCR 402755. Publicly available information regarding onsite groundwater monitoring, and radionuclide concentrations in the environment near BSEP, can be found in the Annual Radiological Environmental Operating Report. The 2009 Annual Report is currently available through the Agency-Wide Documents Access and Management Systems (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html> (accession number ML 101380657). The 30-day report regarding the CST piping leak is also available through ADAMS (accession number ML 110190210).

An exit meeting was conducted for the ISI inspection activities (section 1R08) on March 18, 2011, with Mr. Michael Annacone, and other members of the licensee staff. The licensee did not identify any material provided to the inspector to be proprietary.

Enclosure

On March 25, 2011, the inspectors discussed preliminary results of the onsite RP inspection with Mr. Michael Annacone, and other members of the licensee staff. The inspectors noted that proprietary information was reviewed during the course of the inspection but would not be included in the documented report.

On April 21, 2011 the resident inspectors presented the remaining inspection results to Mr. Joe Frisco, and other members of the licensee staff.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

M. Annacone, Site Vice President
C. Barnhill, Dosimetry Supervisor
L. Beller, Superintendent, Operations Training
W. Brewer, Manager – Maintenance
A. Brittain, Manager – Security
J. Burke, Manager – Outage and Scheduling
B. Davis, Director – Engineering
P. Dubrouillet, Manager – Training
C. Dunsmore, Manager – Shift Operations
J. Frisco, Plant General Manager
C. George, Manager – Technical Support Engineering
K. Gerald, Superintendent – Mechanical Maintenance
S. Gordy, Manager – Operations
L. Grzeck, Lead Engineer - Technical Support
R. Ivey, Manager – Nuclear Oversight Services
F. Jefferson, Manager – Systems Engineering
J. Johnson, Manager – Environmental and Radiological Controls
M. Millinor, Sr. Chemistry Specialist
P. Mentel, Manager - Support Services
R. Mullis, Supervisor – Operations Training
D. Petrusic, Superintendent – Environmental and Chemistry
A. Pope, Supervisor – Licensing and Regulatory Affairs
E. Rochelle, Supervisor, Radiation Control
T. Sherrill, Engineer - Technical Support
P. Smith, Superintendent – Electrical, Instrumentation, and Controls Maintenance
S. Taylor, Supervisor, Radioactive Waste Shipping
J. Titrington, Manager – Design Engineering
M. Turkal, Lead Engineer - Technical Support
J. Vincelli, Superintendent – Radiation Protection
E. Wills, Director – Site Operations

NRC Personnel

Randall A. Musser, Chief, Reactor Projects Branch 4, Division of Reactor Projects Region II

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000325/2011002-01	AV	Failure To Adequately Evaluate And Correct A Condition Adverse To Quality Involving A Manufacturing Defect Of Barton Model 199 Dual Dampener Differential Pressure Units (Section 1R15)
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Opened and Closed

05000325,324/2011002-02	NCV	Failure to follow procedures for analyzing radiological air samples for the presence of alpha emitters (Section RS01)
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Closed

TI 2515/179	TI	Verification of Licensee Responses to NRC Requirement for Inventories of Materials Tracked in the National Source Tracking System Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207) (Section 4OA5.2)
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TI 2515/177	TI	Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter (GL) 2008-01) (Section 4OA5.3)
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LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

1OP17, Residual Heat Removal System Operating Procedure
2OP17, Residual Heat Removal System Operating Procedure
1OP43, Service Water System Operating Procedure
2OP-43, Service Water System Operating Procedure

Section 1R05: Fire Protection

0PFP-CB, Control Building Prefire Plans
0PFP-PBAA, Power Block Auxiliary Areas Prefire Plans SW, RW, AOG, TY, EY
0PFP-013, General Fire Plan
2PFP-RB, Reactor Building Prefire Plans Unit 2
0OP-41, Fire Protection and Well Water System
0PT-34.11.2.0, Portable Fire Extinguisher Inspection

Section 1R07: Heat Sink Performance

0ENP-2704, Administrative Control of NRC Generic Letter 89-13 Requirements
NLS-90-005, CP&L Response to NRC Generic Letter 89-13
0ENP-2705, Performance Trending of RHR Heat Exchangers
Calculation 0SW-0096, Calculation for Tube Plugging and Fouling of Service Water Safety
Related Heat Exchangers

Section 1R08: In-Service Inspection

Procedures

0BNP-TR-001, Inservice Inspection Technical Report, Revision 10
0BNP-TR-002, Containment Inspection Plan, Revision 15
0BNP-TR-016, Inservice Inspection Plan for the Fourth Inspection Interval, Revision 5
0PLP-08, Repair/Replacement Program, Revision 29
0PT-20.5.1, Primary Containment Inspection, Revision 21
0PT-90.1, Vessel Internal Component Remote Examinations, Revision 36
 0SP-10-1005, Procedure for Manual Phased Array Examination of Dissimilar Metal
 Welds, Revision 1
NDEP-201, Liquid Penetrant Examination (visible dye, solvent removable), Revision 31
NDEP-301, Dry Powder Magnetic Particle Examination, Revision 19
NDEP-443, Ultrasonic Examination of Forgings and Bars (ASME III), Revision 2
NGGM-PM-0003, Corporate Welding Manual, Revision 88
NOS-NGGC-0100, Nuclear Oversight Assessment Process, Revision 10

Calculations

0B11-0036, Jet Pump Thermal Sleeve-to-Riser Elbow Weld Flaw Evaluation
TLR 10-034

Corrective Action Documents

324134, Welding Rods Found In Basement of Service Water Building, 03/09/2009
 324973, Flaws Found In the Jet Pump Riser "C" Elbow, 03/12/2009
 325099, Incorrect Welder Symbol and Use of Expired Welder, 03/13/2009
 326549, ISI Repair/Replacement Requirements Not Met, 03/21/2009
 326867, Uncontrolled Welding Material, 03/23/2009
 346843, ASME Code Required PMT Not Performed, 07/24/2009
 355640, Incorrect Weld Material Used On SW Pump Assembly Repair, 09/16/2009
 358362, Unqualified MT Powder Used For Examination, 10/01/2009
 391615, BNP- Violation of NW-03 2.2, 2.3, 04/06/2010
 425666, Preheat Not Performed Prior to Tack Welding Piping, 10/07/2010
 447430, Buried Pipe; Line 2-FO-5000-3-Fgs1; Excluded From BP Program, 02/13/2011
 452050, RNP RAI Response - Rx Vessel Beltline Weld, 03/08/2011

Drawings

2-FP-55013
 SK-9800329-M-2001
 SK-9800329-M-2002

Other

B-ISI-09-01, Assessment of Inservice Inspection (ISI), Inservice Testing (IST) and 10CFR50 Appendix J Programs
 B-ISI-11-01, Assessment of Inservice Inspection (ISI), Inservice Testing (IST) and 10CFR50 Appendix J Programs
 BNOS 10-057, BNOS Finding Closures – November 2010, 11/30/2010
 Certified Material Test Reports for Heat Nos.: 737880, 082324, 832XNB, 386156, 286390, 86532, 42379
 Examiner Qualification Records for Examiners: 8865, 37957
 Krautkramer Transducer Certificate of Conformity: SN 01P2VW-1
 Welder Qualification Status Report for Welder: A30, H65, B92, C62, W39, W46, N62, F99, AF4
 Welding Procedure Qualification Reports: 193A, 193B, 193C, 193D, 251, 6, 6A, 6B, 6C, 54, 210, 5, 282
 Welding Procedure Specifications: 01 2 02, 08 3 30, 08 2 01, 08 3 01, 01 1 01, 01 3 10, 1 2 78, 01 3 04
 WO 01490271-01, 2-B21-F022D; Perform Guide Pad Mod IAW EC 47474
 WO 01525781-01, Refurbish Contaminated MSIV Bonnets
 WO 01672606-01, Seal Weld the 1-B32-F031A Body-to-Bonnet Joint

Section 1R11: Licensed Operator Regualification

OTPP, Licensed Operator Continuing Training Program
 TRN-NGGC-0014, NRC Initial Licensed Operator Exam Development and Administration
 1EOP-01-LPC, Level/Power Control
 0PEP-2.1.1, Emergency Control – Notification of Unusual Event, Alert, Site Area Emergency, or General Emergency
 0PEP-02.1, Initial Emergency Actions

Attachment

Section 1R12: Maintenance Effectiveness

ADM-NGGC-0101, Maintenance Rule Program
 NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants
 ADM-NGGC-0203, Preventive Maintenance and Surveillance Testing Administration
 EGR-NGGC-0351, Condition Monitoring of Structures
 ADM-NGGC-0203, Preventive Maintenance and Surveillance test Administration

Section 1R13: Maintenance Risk Assessment and Emergent Work Control

0AP-022, BNP Outage Risk Management
 ADM-NGCC-0104, Work Management Process
 0AI-144, Risk Management
 ADM-NGGC-0006, Online EOOS Model

Section 1R15: Operability Evaluations

OPS-NGGC-1305, Operability Determinations
 OPS-NGGC-1307, Operational Decision making
 0ENP-54, Building Ventilation Pressure Control Program

Section 1R18: Plant Modifications

EGR-NGGC-0005, Engineering Change
 EGR-NGGC-0011, Engineering Product Quality

Section 1R19: Post Maintenance Testing

0PLP-20, Post Maintenance Testing Program

Section 1R20: Outage Activities

1OP17, Residual Heat Removal System Operating Procedure
 0SMP-RPV502, Reactor Vessel Reassembly
 0MMM-015, Operation and Inspection of Cranes and Material Handling Equipment
 0GP-05, Unit Shutdown
 0GP-06, Cold Shutdown to Refueling
 0GP-07, Preparations for Core Alterations
 0FH-11, Refueling

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures, Guidance Documents, and Manuals
 0AI-112, Control of Material In Spent Fuel Pool, Revision (Rev.) 19
 0E&RC-0040, Administrative Controls for High Radiation Areas, Locked High Radiation Areas,

Attachment

and Very High Radiation Areas, Rev. 32
 0E&RC-0100, Radiation Surveys Methods, Rev. 34
 0E&RC-0111, Survey Methods for Removable Surface Contamination, Rev. 32
 0E&RC-0112, Hot Particle Control, Rev. 5
 0E&RC-0120, Routine/Special Airborne Radioactivity Survey, Rev. 24
 0E&RC-0175, Radiological Controls for Diving Operations, Rev. 7
 0E&RC-0212, Decontamination for Areas, Materials, and Tools, Rev. 18
 0E&RC-0117, Control Of Work in the Hot Machine Shop, Rev. 2
 0E&RC-0215, Removal of Materials from the Radiological Control Area, Rev. 44
 0E&RC-0230, Issue and Use of Radiation Work Permit, Rev. 48
 0E&RC-0241, Health Physics Coverage in the Drywells during Fuel and Irradiated Component Movement, Rev. 15
 0E&RC-0261, Drywell Entry, Rev. 25
 0E&RC-0275, Installation, Testing, and Use of Enclosed Radiological Containment Devices, Rev. 4
 0E&RC-0290, Control Of Brunswick Nuclear Plant Radiography Activities, Rev. 12
 0E&RC-0293, Management of Radioactive Material & Radwaste Containers at BNP, Rev. 3
 0E&RC-0495, Failed Fuel Response, Rev. 0
 0E&RC-0500, Inventory Control and Leak Testing of Radioactive Sources, Rev. 24
 0E&RC-3101, Radiological Environmental Monitoring Program , Rev. 30
 CAP-NGGC-201, Self-Assessment/Benchmark Programs, Rev. 15
 CAP-NGGC-200, Condition Identification and Screening Process, Rev. 33
 CAP-NGGC-205, Condition Evaluation and Corrective Action Process, Rev. 12
 DOS-NGGC-0002, Dosimetry Issuance, Rev. 27
 HPS-NGGC-0001, Radioactive Material Receipt and Shipping Procedure, Rev. 31
 HPS-NGGC-0003, Radiological Posting, Labeling and Surveys, Rev. 15
 HPS-NGGC-0009, Operation of Radiation/Contamination Survey Instruments/Equipment, Rev. 7
 HPS-NGGC-0013, Personnel Contamination Monitoring, Decontamination, And Reporting, Rev. 14
 HPS-NGGC-0014, Radiation Work Permits, Rev. 8
 HPS-NGGC-0016, Access Control, Rev. 6
 HPS-NGGC-0019, Conduct of Radiological Protection Briefings, Rev. 3
 HPS-NGGC-0023, Remote Radiological Monitoring, Rev. 4
 HPS-NGGC-0024, Alpha Monitoring Guidelines, Rev. 3

Records and Data Reviewed

ORST-76.0, Radiological Surveillance of BNP's 61BTH Independent Spent Fuel Storage Installation (ISFSI), Rev. 0, Dated 01/21/11, 01/27/11, 02/03/11, and 02/09/11
 Brunswick Steam Electric Plant, Unit Nos. 1 and 2, National Source Tracking System Initial Inventory, Letter Dated 01/13/09
 Confirmation of Annual Inventory Reconciliation, Dated 01/07/11

DAC Reports, Sample IDs 110641_1, HP Charcoal Air Sample U/1 TB I/S LPT "A"; 110650, HP Charcoal Air Sample I/S "A" LPT, Internal Breach; and 110660_1, HP Particulate Air Sample 2-DW-17'F050A Air Sample
 Description of Materials in Spent Fuel Pool, Unit 1, Work Orders 1552521-01, Dated 02/04/10;

Attachment

1324426-01, Dated 04/21/10; 1581360-01, Dated 05/18/10; 1634960-01, Dated 08/17/10; 1688947-01, Dated 11/16/10; and 1741098-01, Dated 02/15/11
Description of Materials in Spent Fuel Pool, Unit 2, Work Orders 01698461-01, Dated 02/24/10; 1649908-01, Dated 09/14/10; and 1765737-07, Dated 02/21/11
Low-Level Radioactive Waste Analysis Data Sheet, Sample Tracking No. 10R032329, 2010 DAW Smears, Dated 01/06/11
NRC NSTS Annual Inventory Reconciliation Cover Letter Response, Dated 01/27/10
Radiation Work Permit (RWP) No. 00004928 06, DW – Major Projects Group Activities (B220R1)
RWP No. 00005248 02, DW – CRD Exchanges Requiring Multibadging (B220R1)
RWP No. 00005249 00, DW – ISI Inspection – (Include Maintenance Support) (B220R1) (High Risk)
RWP No. 00005258 02, DW – CRD Exchanges Requiring Multibadging (B220R1)
RWP No. 00005267 04, DW – MOV Activities (B220R1)
RWP No. 00005279 01, DW – Inboard MSIV – Modification/Repair/Support (B220R1)
RWP No. 00005303 01, DW – NOS/QC Outage Activities, Snubber Inspections
RWP No. 00005309 02, RX Vessel Disassembly/Reassembly – Cavity (B220R1)
RWP No. 00005316 03, DW – E11-F050A Activities (B220R1), Disassemble the Valve and Replace Bonnet Gasket
RWP No. 00005334 03, Radiography Activities (No DW) (B220R1)
RWP No. 00005335 08, DW – Chemical Decontamination Activities (B220R1)
RWP No. 00005374 03, Torus Diving (B220R1)
Radiological Environmental Operating Report 2009, Brunswick Steam Electric Plant
Radiological Survey (RS) No. 011111-011, ISFSI Quarterly Survey
RS No. 011111-007, ISFSI Quarterly Survey
RS No. 030511-007, Flush Bottom Head Drain Line Under Vessel, Sheet 2 of 6
RS No. 030511-007, Initial Entry Unit 2 Drywell 17' Overhead, Sheet 6 of 7
RS No. 030511-007, Initial Survey -5' DW, Sheet 5 of 7
RS No. 030511-007, Initial Survey 17' Drywell Floor Level, Sheet 3 of 7
RS No. 030511-007, Initial Survey Drywell 38' Elevation, Sheet 4 of 7
RS No. 030511-007, Survey Prior to Under Head Flush, Drywell Undervessel, Sheet 1 of 7
RS No. 030611-007, Initial Entry Surveys, Sheet 2 of 3
RS No. 030711-017, Post Shielding Survey 67' General Area
RS No. 030811-012, Pre-Flush Survey on F050 Drain Valves 17' Drywell Floor Level
RS No. 030811-016, Survey for ALARA Flush Work Area
RS No. 030811-039, A-RCIP Housing Inspection 17' Under Grading, Page 2 of 2
RS No. 030811-039, B-RCIP Housing Inspection 17' Under Grading, Page 1 of 2
RS No. 030811-040, Cut V-114 line in RWCU Heat Exchanger & Pump rooms
RS No. 030911-010, Pre-Dive Survey
RS No. 031111-007, Pre-Dive Survey
RS No. 031111-019, Workers Cutting Out 6" Pipe from RWCU
Radiological Survey Record (RSR), One Line Air Sample Survey Form (OLASSF), Survey No. 030511-007, U/2 DW 17'
RSR, OLASSF, Survey No. 030811-040, U2 RB 50' CWCU room
RSR, OLASSF, Survey No. 030811-059, U2 TB 70' G/A
RSR, OLASSF, Survey No. 030911-003, Inside Low Pressure Turbine A
RSR, OLASSF, Survey No. 030911-003, Inside Low Pressure Turbine B

RSR, OLASSF, Survey No. 030911-003, U/2 Inside "B" Low Pressure Turbine
 RSR, OLASSF, Survey No. 030911-031, 2TB 45' 2B Condenser
 RSR, OLASSF, Survey No. 030911-054, U2 TB 70'
 RSR, OLASSF, Survey No. 031011-007, U2 TB 70' North and South Condenser
 RSR, OLASSF, Survey No. 031011-009, 45' Condenser (Inside)
 RSR, OLASSF, Survey No. 031011-010, 2 DW 17' F050A
 RSR, OLASSF, Survey No. 031111-004, Torus NW 0'
 RSR, OLASSF, Survey No. 031111-019, 2RB 20' DW Entrance Roof

Corrective Action Program (CAP) Documents

Action Request Number (AR) 00364593, BNP Safety Self Assessment (Quick Hit),
 Dated 12/03/10

AR 00455307, No alpha sample was done on a 1.45 DAC Air Sample, Dated 03/24/11

Section 2RS2: ALARA

Procedures, Guidance Documents, and Manuals

0AI-52, ALARA Committee Activities and Responsibilities, Rev. 16
 0AI-90, Cobalt Reduction Program, Rev. 1
 0E&RC-0230, Issue and Use of Radiation Work Permit, Rev. 48
 0E&RC-4100, ALARA Program, Rev. 13
 0E&RC-4101, ALARA Review of Plant Modifications and EC, Rev. 4
 0E&RC-4104, ALARA and Radwaste Reduction Suggestions, Rev. 5
 0E&RC-4270, Elemental Cobalt Sampling, Rev. 1
 ADM-NGGC-0105, ALARA Planning, Rev. 10
 CAP-NGGC-201, Self-Assessment/Benchmark Programs, Rev. 15
 CAP-NGGC-200, Condition Identification and Screening Process, Rev. 33
 CAP-NGGC-205, Condition Evaluation and Corrective Action Process, Rev. 12
 HPS-NGGC-0014, Radiation Work Permits, Rev. 8
 HPS-NGGC-0019, Conduct of Radiological Protection Briefings, Rev. 3

Records and Data

Active Hot Spot Lists for 1RB and 2RB, Dated 03/10/11
 ALARA Work Plan (AWP) No. 09-111, U/2 B220R1 Integrated Inspections, Rev. 0
 AWP No. 09-115, B220R1 MOV Project, Rev. 0
 AWP No. 09-117, B220R1 Insulation Removal/Replacement, Rev. 0
 AWP No. 09-118, B220R1 Scaffold, Rev. 0
 AWP No. 09-119, B220R1 MSIV Activities, Rev. 0
 AWP No. 09-131, Refuel Floor Activities (B220R1), Rev. 0
 AWP No. 09-146, (B220R1) 2-E-11-F050A Repairs, Rev. 0
 AWP No. 09-155, U/2 RX Recirc & RWCU Chemical Decon, Rev. 0
 AWP No. 09-160, 2-B-F023A/F031A Seal Weld Repair, Rev. 0
 BNP ALARA Committee Meeting Minutes, Dated 01/05/11, 01/17/11, 02/10/11, and 02/28/11
 BNP 2010 Radiological Status Report
 Brunswick Nuclear Plant, ALARA Strategic Plan, 2009 Rev. 1, Dated 11/04/09
 RP Lessons Learned for B118R1
 Temporary Shielding Request (TSR) No. 2-RF-590, DW 17' - Curtains

TSR No. 2-RF-591, DW 17' ED Line
 TSR No. 2-RF-595, DW 33' RHR 50A & 60A & Associated Drains
 TSR No. 2-RF-617, DW 33' RHR 50B & 60B & Associated Drains
 TSR No. 2-RF-629, RB 61' RWCUC Penetration Room
 TSR No. 2-RF-647, Shielding on Scaffold E11-F050 Valves in Drywell
 Unit 2 (U2) RCS Soluble and Insoluble Co-60 Graphs for February 2009, (B219R1) and
 March 2011, (B220R1)
 U2 RWCUC Percent Removal Efficiency Graph for 2A and 2B RWCUC Co-60 Efficiency, Undated

CAP Documents

AR 00362783, ALARA Program Effectiveness Self Assessment, Dated 02/19/10
 AR 00362785, Source Term Reduction Benchmark, Dated 12/08/10

Section 2RS3: In-Plant Airborne Radioactivity Control and Mitigation

Procedures, Guidance Documents, and Manuals

OE&RC - 0175, Radiological Controls for Diving Operations, Rev. 7
 OE&RC - 0220, Respiratory Protection Program, Rev. 46
 OE&RC - 0221, Cleaning, Maintenance, and Leak Testing of Respiratory Equipment, Rev. 26
 OE&RC - 0292, SCBA Use and Maintenance, Rev. 10
 OE&RC - 0310, Calibration of NMC Continuous Air Monitors, Rev. 17
 2OP-37.1, Reactor Building Heating and Ventilation System Operating Procedure, Rev. 56
 CAP - Nuclear Generation Group Standard Procedure (NGGC) - 0200, Condition Identification
 and Screening Process, Rev. 33
 CAP-NGGC-205, Condition Evaluation and Corrective Action Process, Rev. 12
 Health Physics Standard (HPS) - Nuclear Generation Group (NGGC)-0006, Quantitative Fit
 Testing, Rev. 7
 Nuclear Generation Group Health Physics Standard Procedure (HPS-NGGC)-0020, Calibration
 and Operation of the Eberline AMS-4 Air Monitor, Rev. 2
 Nuclear Generation Group Safety Standard Procedure (SAF-NGGC)-2170, Occupational Health
 Programs for Medically Qualified Power Plant Workers, Rev. 17
 RWP 00005244, Dry Well (DW) Initial Entry / Strongback Removal /Leak Hunt (B220R10)
 RWP 00005840 00, DW Insulation - Remove / Replace (B220R1),
 Unit 0 Environmental & Radiation Control Procedure (OE&RC) -0135, Sampling of Breathing Air,
 Rev. 13
 Unit 2 Operating Procedure (2OP-24), Containment Atmosphere Control System, Rev. 148

Records and Data Reviewed

ALARA Work Plan, Refuel Floor Activities (B220R1)
 Analysis of Breathing Air Data Sheets and Supporting Data Sheets for Unit 1 Reactor Building
 20 Foot Southwest (1RB 20'SW) Valve Number 1 SA-V351; Unit 2 (2)RB 20' SW Valve
 2-SA-V351; Fire House SCBA Compressor; Sandblast Shack - Ingersol Rand
 Compressor; and Sandblast Shack - Clemco CAP-1 Compressor; for the following
 quarters: 1st Quarter 2009, 2nd Quarter 2009, 3rd Quarter 2009, 4th Quarter 2009;
 1st Quarter 2010, 2nd Quarter 2010, 3rd Quarter 2010, 4th Quarter 2010, 1st Quarter 2011
 Checklist for Respiratory Protection Equipment, 03/09, 09/09, 08/10, 09/10
 Continuous Air Monitor (CAM) Calibration Data Sheet for: CAM 17 (08/06/09, 07/21/10),

Attachment

CAM 18 (04/13/09, 03/10/10); CAM
 Progress Energy Nuclear Generation, Student Handout Respiratory Protection Training, Rev. 19
 Progress Energy Nuclear Generation, Respiratory Protection Training, Lesson Number
 GNC10G/GN7C10G/GNgC24G, Rev. 19
 Eberline AMS-4 Calibration Record for: Electronics and Sample Head 1930 [Noble Gas],
 (10/3/10, 01/28/11); Electronics and Sample Head 1770 [In-Line], (01/04/10, 01/05/11);
 Electronics and Sample Head 1769 [In-Line], (01/11/10, 12/29/10)
 Survey No.030611-051, On-Line Air Sample Beta Particulate, for Insulation Removal from
 F023A & F031A, Unit 2 5' Location, Dated 03/06/11
 Survey No. 030911-006, On-Line Air Sample Form - Beta Particulate, Routine, Unit 2 17'
 Location, Dated 03/08/11
 Survey No. 031011-018, On-Line Air Sample Form – Beta Particulate, Gamma Charcoal,
 Dated 03/09/11
 Scott-Air-Pak 4.5 and Ska-Pak Inspection Record, 1st Quarter 2009, 4th Quarter 2010

CAP Documents

AR 00317541, Expiration of fit test and SCBA performance exercised elapsed for licensed
 Operator
 AR 00324923, Respirator hoods not available for use
 AR 00327774, Respirator shipment from processing vendor unacceptable
 AR 00332710, Mechanic internally contaminated during B2119R1 refueling outage performing
 2A recirculation pump insulation replacement
 AR 00394094, Not enough respirators available to support maintenance on 1-B32-FO31B
 AR 00452585, Add Guidance for Slow and Fast Alarm Set Points
 AR 00452726, Discrepancies in OE&RC - 0521
 B-RP-10-01, Assessment of Radiological Protection, Dated 11/30/10

Section 2RS8: Radiological Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

Procedures, Guidance Documents, and Manuals

Brunswick Nuclear Plant Process Control Program (PCP), Rev. 5
 Cask Book for MODEL 8-120B USA91/9168/B(U), Rev. 33
 HPS-NGGC-0001, Radioactive Material Receipt and Shipping Procedure, Rev. 31
 HPS-NGGC-0002, Vendor Cask Utilization Procedure, Rev. 18
 HPS-NGGC-0003, Radiological Posting, Labeling and Surveys, Rev. 15
 HPS-NGGC-0009, Operation of Radiation/Contamination Survey Instruments/Equipment,
 Rev. 7
 OE&RC-0293, Management of Radioactive Material and Radwaste Containers at BNP, Rev. 3
 OE&RC-0515, Review of Process Control Program, Rev. 6
 OE&RC-0521, Use of the Low Level Radwaste Storage Processing Facility, Rev. 17
 OE&RC-0533, Use of the DAW Shredder/Compactor System, Rev. 8
 OE&RC-0560, Collection and Preparation of Samples for 10CFR61 Analysis, Rev. 6
 OE&RC-2212, Calibration/Operation of Genie Gamma Spectroscopy System, Rev. 1
 OSP-07-004, Operation of EnergySolution's LWP-5 Equipment in the Radwaste Building, Rev. 5
 OOI-03.10, Transferring Spent Resins of Filter Media to the Radwaste Processing Area, Rev. 11
 OOP-06.15, Spent Resin Storage Tank Operating Procedure, Rev. 35

Shipping Records and Radwaste Data

TAP-404 Attachment 1, Training Roster, Course Code RC6C003G, Rad Mat/Reg Awareness [49CFR Subpart H Review], Dated 08/02/10

Low-Level Radioactive Waste Analysis Data Sheet - Chem Decon Resin, Sample Tracking Number 10R029053, Dated 05/26/10

Low-Level Radioactive Waste Analysis Data Sheet - Chem Decon Pre Filter, Sample Tracking Number 10R029055, Dated 06/01/10

Low-Level Radioactive Waste Analysis Data Sheet - Powdex Resin, Sample Tracking Number 10R031836, Dated 01/25/11

Low-Level Radioactive Waste Analysis Data Sheet – 2010 DAW Smears, Sample Tracking Number 10R032329, Dated 01/17/11

Low-Level Radioactive Waste Analysis Data Sheet - RWCU Resin, Sample Tracking Number 10R032140, Dated 12/16/10

Radioactive Material Receipt Logs – 2010

Radioactive Material Shipment Logs – 2009

Radioactive Material Shipment Logs – 2010

REG-NGGC-0010, Attachment 1 – Screen - 10 CFR 50.59 Screening package for Installation of the Unit 2 Saltwater Release (SWR) system (EC 71824)

Shipment No. 09-003, Radioactive Material, excepted package-limited quantity of material, 7, UN2910, (1) c-van GIC trash (DAW), Dated 01/14/09

Shipment No. 10-113, Radioactive Material, Low Specific Activity (LSA-II), 7, UN3321, Fissile Excepted, RQ-Radionuclides, Dewatered Resin, Dated 08/31/10

Shipment No. 10-156, UN2916, Radioactive Material, Type B(U) package, 7, Fissile Excepted, RQ-Radionuclides, Dewatered RWCU Resin, Dated 12/21/10

Shipment No. BNP 11-020, UN2912, Radioactive Material, Low Specific Activity (LSA-1), 7, Low activity radioactive waste in 5 shipping containers on a rail car, Dated 03/08/11

Shipment No. 11-025, UN2910, Radioactive Material, excepted package-limited quantity of material, 7, Metal box containing Condensate Pump Motor, Dated 03/08/11

CAP Documents

B-EC-FR-10-1, Focused Review of the Chemical Decontamination Project, Dated 03/16/10

AR 00367225, Incorrect Less Than Value Supplied by Vendor

AR 00401240, BNP Received a Radioactive Yellow III Labeled Shipment on 05/24/10 that required placards but was not placarded in accordance with 49 CFR 172.504

AR 00384789, Upon Receipt of a Shipment of Radioactive Equipment from HB Robinson Plant on Wednesday Evening (03/03/10), it was noted that one of the Radioactive Placards was Missing

Section 40A1: Performance Indicator VerificationProcedures

REG-NGGC-0009, NRC Performance Indicators and Monthly Operating Report Data

Records and Data

Monthly PI Reports, January, 2010 – December, 2010

Procedures, Guidance Documents and Manuals

CAP-NGGC-0200, Condition Identification and Screening Process, Rev. 33
 CAP-NGGC-0205, Condition Evaluation and Corrective Action Process, Rev. 12
 HPS-NGGC-0016, Access Control, Rev. 6
 HPS-NGGC-1000, Radiation Protection – Conduct of Operations,
 NGGC-PM-0002, Radiation Control and Protection Manual, Rev. 38
 OE&RC-0040, Administrative Controls for High Radiation Areas, Locked High Radiation Areas,
 and Very High Radiation Areas, Rev. 32
 REG-NGGC-0009, NRC Performance Indicators And Monthly Operating Report Data, Rev. 10

Records and Data Reviewed

BSEP 10-0060, Radioactive Effluent Release Report for 2009, 4/26/10
 BNP DRD Alarm Evaluation (DRDE) number, 00388039, 00384103, 00384158, 00392047, and
 00404753
 Carolina Power and Light, Brunswick Steam Electric Plant, Liquid Effluent Dose Summation
 Report for the period 1/1/2010 – 12/31/10, 1/20/11
 Carolina Power and Light, Brunswick Steam Electric Plant, Gaseous Effluent Dose Summation
 Report for the period 1/1/2010 – 12/31/10, 1/20/11
 DRD Dose and Dose Rate Alarm Reports, 1/1/2010 – 2/28/2011
 Occupational Exposure Control Effectiveness Data (REG-NGGC-0009, Attachment 13),
 January 2010 – February 2011
 RETS/ODCM Radiological Effluent Occurrences (REG-NGGC-0009, Attachment 14), January
 2010, to February 2011

CAP Documents

AR 00386973, Individual Receives Accumulated Dose Alarm
 AR 00387793, Individual Exceeded Dose Alarm Set Point
 AR 00388120, Worker Received Accumulated Dose Alarm
 AR 00390033, Excessive Gap in HRA Swing Gate Boundary
 AR 00443469, Incorrect RWP Used for Task
 AR 00445886, DRD Alarm
 B-EC-09-1, Assessment of Environmental and Chemistry, Rev. 1, 11/18/09
 B-RP-09-01, Assessment of Radiation Protection, Dated 12/10/09
 B-RP-10-01, Assessment of Radiation Protection, Dated 11/30/10

Section 4OA5: Other Activities**TI 2515/177**Licensing Basis Documents

ML0814200260, Brunswick Steam Electric Plant, Unit Nos. 1 and 2 - Three Month Response to
 NRC Generic Letter 2008-01, Managing Gas Accumulation in Emergency Core Cooling;
 Decay Heat Removal, and Containment Spray Systems, May 9, 2008
 ML0829504660, Brunswick Steam Electric Plant, Unit Nos. 1 and 2 - Nine Month Response to
 NRC Generic Letter 2008-01, Managing Gas Accumulation in Emergency Core Cooling,
 Decay Heat Removal, and Containment Spray Systems, October 10, 2008

ML102100026, Brunswick Steam Electric Plant, Unit No. 1 - Post-Outage Supplemental Response to Generic Letter 2008-01, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems, July 22, 2010
 ML0921605951, Brunswick Steam Electric Plant, Unit No. 2 - Post-Outage Supplemental Response to Generic Letter 2008-01, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems, July 27, 2009
 ML100040003, Brunswick Steam Electric Plant, Unit Nos. 1 and 2 - Response to Request for Additional Information Regarding Generic Letter 2008-01, December 21, 2009

Procedures

2OP-18, Core Spray System Operating Procedure, Rev 64
 1OP17, Residual Heat Removal System Operating Procedure, Rev. 107
 2OP17, Residual Heat Removal System Operating Procedure, Rev. 158
 1OP-18, Core Spray System Operating Procedure, Rev. 53
 2OP-18, Core Spray System Operating Procedure, Rev. 65
 1OP-19, High Pressure Coolant Injection System Operating Procedure, Rev. 81
 2OP-19, High Pressure Coolant Injection System Operating Procedure, Rev. 125
 0AOP-32.0, Plant Shutdown from Outside Control Room, Rev. 49
 0AOP-36.1, Loss of Any 4160V Buses or 480V E-Buses, Rev. 55
 0AOP-36.2, Station Blackout, Rev. 45
 0EOP-01-LEP-01, Alternate Coolant Injection, Rev. 30
 0EOP-01-LEP-03, Alternate Boron Injection, Rev. 28
 OPS-NGGC-1305, Operability Determinations, Rev. 4
 OPS-NGGC-1307, Operational Decision Making, Rev. 3

Surveillance Procedures

0PT-07.2.4a, Core Spray System Operability Test – LOOP A, Rev 67
 0PT-08.1.3a, LPCI/RHR System Component Test – LOOP A, Rev 7
 0PT-08.1.3b, LPCI/RHR System Component Test – LOOP B, Rev 12
 0PT-08.2.2c, LPCI/RHR System Operability Test – LOOP A, Rev 77
 0PT-08.2.2b, LPCI/RHR System Operability Test – LOOP B, Rev 88
 0PT-09.2, HPCI System Operability Test, Rev. 133
 0PT-09.3a, HPCI System Component Test, Rev. 26

Calculations

0E11-028, Determination of RHR and CS NPSH Margin after Power Uprate, Rev 5
 0E21-0002, Determination of Core Spray NPSH margins, aligned to CST, Rev 0
 0EOP-WS-13.3, Core Spray Vortex Limit, Rev 4
 EC63657, Attachment B - Hydraulic Calculation for Core Spray, (5/2006)
 NAI-1415-001, Evaluation of Gas Accumulation in Brunswick ECCS Suction Piping, Rev 3
 NAI-1415-002, Evaluation of Gas Accumulation in Brunswick Nuclear Plant ECCS Discharge Piping, Rev 3
 PCI-NPD-CPL01, Head Loss Calculations for Bare Sure-Flow™ Suction Strainers at Brunswick 1 and 2 Nuclear Units, Rev 2

Engineering Change

EC 71187, NRC Generic Letter 2008-01 Response, Rev 0

EC 73438, Installation of new high point vents on Unit 1, Rev 0
 EC 75926, Basis for Reducing Frequency of Periodic UT Inspections of ECCS Systems, Rev 0

Miscellaneous

2-FP-50428, 2A Core Spray Pump Curve
 BN-18.0.01, Core Spray Subsystem, Rev 3
 BWROG-0000-0087-5676, BWR Owners' Group Technical Report: ECCS Pumps Suction Void Fraction Study, Rev 0
 BWROG-0000-0088-8669, BWR Owners' Group Technical Report: Effects of Voiding in ECCS Drywell Injection Piping, Rev 0
 EWR 05702, Vendor recommendation GE SIL 375: Power supply for discharge line fill systems on BWR/4, 5 & 6 ECCS and RCIC systems, 8/12/87
 FP-20247, BORG-WARNER Corp Technical Manual for Core Spray pumps, Rev C
 CAP-NGGC-0201-8-14, Quick Hit Self-Assessment Report – Assessment Number: QRPT 00426545, Rev. 14
 Work Order Package 00035536, 1-E41-F005, Check valve disassembled, (11/30/10)
 NCEES Fundamentals of Engineering Supplied-Reference Handbook, 7th Edition
 Memo Response to Open Items (1) and (2) from NRC Inspection Exit – Managing Gas Accumulation in ECCS (GL 08-01, TI-2515/177), 2/16/2011
 Quick hit Self Assessment Report, QRPT 00426545, NRC Inspection Manual, Temporary Instruction 2515/177

Drawings

D-02524, Reactor Building Core Spray System Piping Diagram (Sheet 1), Rev 40
 D-02524, Reactor Building Core Spray System Piping Diagram (Sheet 2), Rev 40
 D-25025, Piping Diagram for Residual Heat Removal System Units 1 and 2, Sheets 1A, 1B, 2A and 2B, Rev. 55 and 68
 D-25026, Piping Diagram for Residual Heat Removal System Units 1 and 2, Sheets 1A, 1B, 2A and 2B, Rev. 60 and 66
 D-25023, Piping Diagram for Reactor Building High Pressure Coolant Injection System Units 1 and 2, Sheets 1 and 2, Rev. 60 and 51
 D-25024, Piping Diagram for Reactor Building Core Spray System Units 1 and 2, Sheets 1 and 2, Rev. 41 and 37

Corrective Action Documents

207093, GE SIL 375: Power Supply for Discharge Line Fill Systems on BWR 4, 5, & 6 ECCS and RCIC Systems
 234689, The HPCI discharge check valve, E41-F005, not tested in the closed function
 295801, NRC GL 2008-01 Investigation Documentation
 330183, Gas void located prior to monthly 2A CS venting
 315832, Approx 3 cubic inch void found in abandoned line 2-E11-89-4-300
 325947, Gas voids located following fill and vent of 2B Core Spray system
 326774, Gas voids located following fill and vent of 2B RHR system
 328610, Gas void located following fill and vent of the 2A CS system
 330263, Gas voids located following fill and vent of RHR system
 331185, Gas voids located following HPCI system fill and vent
 331364, Gas void found during post vent UT of RHR

349218, Gas Voids located in 1A RHR LOOP following fill and vent
393166, Trend gas void found CS system B118R1 following fill and vent
412833, Trend gas void(s) found in CS system following fill and vent
434981, SA#426545, D1, GL 08-01 Void Vol. Accept. Criteria
435011, SA#426545, D5, Initial GL 08-01 Void Assessment Performed W/O
435039, SA#426545, D3, Gas Accumulation Locations not Adequately Identified